We claim:

1. A hydrogen management system comprising:

a container having therein metal particles in contact with an aqueous electrolyte;

a recombination catalyst separate from the aqueous electrolyte in vapor communication with the container, the catalyst catalyzing the reaction of hydrogen and oxygen to form water; and

an oxygen source connected to the container that provides oxygen to the interior of the container, wherein hydrogen gas present in the container can contact the recombination catalyst and combine with oxygen to form water.

2. The hydrogen management system of claim 1 wherein the metal comprises zinc, an alloy of zinc or a combination thereof.

3. The hydrogen management system of claim 1 wherein the metal comprises aluminum, lithium, magnesium, or a combination thereof.

4. The hydrogen management system of claim 1 wherein the recombination catalyst comprises metal selected from the group consisting of platinum, palladium, nickel and combinations thereof.

5. The hydrogen management system of claim 1 wherein the recombination catalyst is located along a top surface of the container.

6. The hydrogen management system of claim 1 wherein the container further comprises a cavity along a top wall of the container, and wherein the cavity comprises the recombination catalyst.

7. The hydrogen management system of claim 1 wherein the container further comprises a vent that can be selectively opened to release gases present inside the container.

8. The hydrogen management system of claim 7 wherein the recombination catalyst is located in at least a portion of the vent.

9. The hydrogen management system of claim 1 wherein the recombination catalyst is separated from the aqueous electrolyte by a head space.

10. The hydrogen management system of claim 1 wherein the oxygen source comprises a valve that allows controlled introduction of ambient air into the container.

11. The hydrogen management system of claim 1 wherein the oxygen source comprises a zinc electrolyzer.

12. The hydrogen management system of claim 1 wherein the oxygen source comprises an oxygen container

13. The hydrogen management system of claim 1 wherein the container further comprises at least one flow inlet and at least one flow outlet for circulating the aqueous electrolyte to other components of an electrochemical cell system.

14. The hydrogen management system of claim 1 further comprising a pump associated with the oxygen source for pumping oxygen into the container.

15. A fuel cell system comprising:

an electrochemical cell stack comprising an anode, a cathode, and a separator between the anode and the cathode;

a container having therein a non-hydrogen fuel suitable for electrochemical reactions in contact with an aqueous electrolyte, wherein the container comprises a flow inlet and a flow outlet coupled to the electrochemical cell stack to provide the non-hydrogen fuel and the electrolyte to the electrochemical cell stack;

a recombination catalyst located in the container, the catalyst catalyzing the reaction of hydrogen and oxygen to form water; and

an oxygen source connected to the storage container such that oxygen can be supplied to container, wherein recombination catalyst is separate from the aqueous electrolyte and wherein the recombination catalyst is positioned in the container such that hydrogen gas present in the container can contact the recombination catalyst and combine with oxygen to form water.

16. The fuel cell of claim 15 wherein the non-hydrogen fuel comprises zinc, an alloy of zinc or a combination thereof.

17. The fuel cell of claim 15 wherein the non-hydrogen fuel comprises aluminum, lithium, magnesium or a combination thereof.

18. The fuel cell of claim 15 wherein the recombination catalyst comprises metal selected from the group consisting of platinum, palladium, nickel and combinations thereof.

19. The fuel cell of claim 15 wherein the oxygen source comprises a member selected from the group consisting of a valve that allows controlled introduction of ambient air into the container, a zinc electrolyzer, and combinations thereof.

20. The fuel cell of claim 15 wherein the zinc electrolyzer is located inside the container.

21. The fuel cell of claim 15 wherein the zinc electrolyzer is separate from the container and oxygen generated by the zinc electrolyzer is supplied to the container though a connection.

22. A method for managing hydrogen in a fuel container for an electrochemical cell system, the method comprising:

reacting hydrogen gas with oxygen gas to form water, wherein a container comprises a non-hydrogen fuel and an electrolyte and wherein a recombination catalyst that catalyzes the reaction of hydrogen and oxygen to form water is in gas communication with the container.

23. The method of claim 22 wherein the container further comprises a temperature sensor.

24. The method of claim 23 wherein the oxygen is supplied at approximately the same rate as the predicted rate of hydrogen evolution at a particular temperature.

25. The method of claim 22 wherein the oxygen is continuously supplied to the container.

26. The method of claim 22 wherein the oxygen is intermittently supplied to the container.